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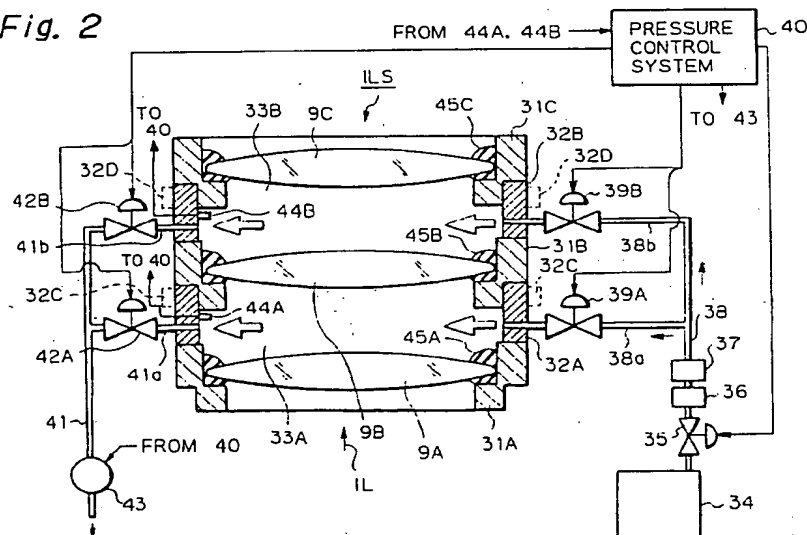
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(54) Exposure apparatus

(57) In the exposure apparatus of the present invention, a sealed chamber (33A) defined by a first lens (9A) and a second lens (9B) in an input lens system (ILS) on a plane of incidence of a fly-eye lens (10) in an illumination optical system is provided. In a gas exchanging step, the impurity gas in the sealed chamber is first exhausted through an electromagnetic valve (42A) provided with a check valve and a gas exhaust pipe (41), using a gas exhaust pump (43) and then, a high-purity nitro-

gen gas is supplied from a gas bomb (34) through a gas supply pipe (38) and an electromagnetic valve (39A) provided with a check valve to the sealed chamber. Using a pressure sensor (44A) provided in the sealed chamber, the gas exchanging step is repeated while maintaining an amount of change in pressure in the sealed chamber within a predetermined allowable range, to thereby reduce the concentration of impurities in the gas in the sealed chamber to a target value.

Fig. 2





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EUROPEAN SEARCH REPORT

Application Number
EP 98 30 2390

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
X	FR 2 708 757 A (FUJITSU LTD) 10 February 1995 (1995-02-10) * page 7, line 27 - page 8, line 6 * * page 9, line 9 - page 12, line 14 * * page 13, line 16 - page 14, line 1 * * page 20, line 25 - line 35 * * figures 2-4,6,9 *	1,5,8, 16, 20-22,24	G03F7/20
A	-& US 5 696 623 A (ARUGA TAKASHI ET AL) 9 December 1997 (1997-12-09) ---	2,3,23	
A	US 4 922 290 A (YOSHITAKE YASUHIRO ET AL) 1 May 1990 (1990-05-01) * column 5, line 41 - column 6, line 59 * * figures 4-6 *	11	
A	US 5 559 584 A (MIYAJI AKIRA ET AL) 24 September 1996 (1996-09-24) * column 5, line 10 - line 59 * * figures 1,2 *	11	
A	EP 0 742 492 A (CANON KK) 13 November 1996 (1996-11-13) * page 9, line 29 - line 52 * * figure 4 * -----	11	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			G03F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 9 March 2000	Examiner HERYET, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03 82 (P4/C01)



European Patent
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Application Number

EP 98 30 '2390

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☒ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
1-3, 5, 8, 11-16, 20-24
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 98 30 2390

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-3, 5, 8, 16, 20-24

Control of gas exchange using illumination system pressure sensor.

2. Claim : 4

Definition of sealed chamber for gas exchange using shaping optical system.

3. Claim : 6

Location of sealed chamber for gas exchange where illuminance is high.

4. Claims: 7, 17-19

Location of sealed chamber for gas exchange in input lens system.

5. Claim : 9

Periodic gas exchange during idling of exposure apparatus.

6. Claim : 10

Periodic gas exchange during assembly and adjustment of exposure apparatus.

7. Claims: 11-15

Gas exchange in substantially stationary pressure state.

8. Claims: 25, 26

Control of gas exchange according to change in light transmittance of optical system.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 30 2390

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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09-03-2000

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